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Handing Over the Controls: The Shift from Pilot in Command to Instructor

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Abstract: Certified flight instructors (CFIs) facilitate and assess student pilot learning during each phase of the training required to obtain the private pilot certificate. However, CFIs receive little formal preparation on how to teach. Twenty-two CFIs were interviewed to examine what CFIs know and believe about teaching adult learners.

Stories of courageous bush pilots, men and women, are an integral part of the history and mystique of Alaska. "Flying began in Alaska ten years after Orville and Wilbur Wright made their historic flight at Kitty Hawk on December 17, 1903" (Fratzke, 2004, p. 7). Each year many Alaskans, motivated by these stories and drawn to the possibilities of visiting the most remote parts of this beautiful state, choose to complete training and instruction to become private pilots. In 2004 (most recent data available), the Federal Aviation Administration (FAA) estimated that there were 8,616 active pilots in Alaska. Of these, 3,518 were private pilots and 878 were student pilots (U.S. Civil Airmen Statistics, 2004).

The private pilot license is the first in the series of ratings and certifications for all levels of piloting. The license is awarded upon passing a check-ride with a Federal Aviation Administration (FAA) examiner. Advancing to the check-ride requires completion of ground school and flight training. Minimally, the student pilot must log 40 hours of flight time that includes 20 hours of flight training from a certified flight instructor (CFI) and 10 hours of solo time. Certified flight instructors (CFIs) facilitate and assess student pilot learning during each phase of the training required to obtain the private pilot certificate. This study explores and examines what CFIs know and believe about teaching adult learners.

The Certified Flight Instructor

The FAA asserts that "the keystone of the present-day training concept is the flight instructor - a professional who should assume full responsibility for all phases of a student pilot's flight and ground instruction" (FAA-G-8082-7A, 2003, para.10). Endorsements of readiness are required to be entered into the student's flight logbook by the CFI before solo flight is allowed. Instructor endorsements of readiness are also required to be entered in the logbook before the knowledge exam and before the practical test exam or check-ride with an FAA examiner.

The FAA outlines and assesses very specific knowledge and skill requirements for the privileges of private pilot certification. The FAA provides equally specific requirements for additional pilot ratings and certifications beyond the initial private pilot certification, including certification as a flight instructor. According to FAR 61.183 (FARAIM, 2006), the general eligibility requirements for a flight instructor certificate or rating are: 18 years of age, able to speak, read, and comprehend English, hold a commercial or transport pilot certificate, pass the fundamentals of instructing test, pass an

aeronautical knowledge exam, receive a logbook endorsement from an authorized instructor on operations, and log 15 hours as pilot-in-command in the specific class and category of aircraft for which an instructor rating is sought.

The flight instructor must have deep knowledge of all aspects of flight and flight operations. The FAA emphasizes that the "successful instructor must meet qualifications far beyond those required for certification as a pilot. An instructor must have a thorough understanding of how learning occurs, and how to apply teaching methods that best foster learning. The most important factor is the instructor's own attitude toward instruction that determines the effectiveness of the teaching method. By understanding the teaching and learning processes, instructors will be better qualified to produce pilots who are able to operate safely with the National Airspace System (NAS)"(FAA-G-8082-7A, 2003, para. 10).

The knowledge test on the fundamentals of instruction consists of 50 multiple choice questions. The minimum passing score on the test is 70 percent. The content covered on the test includes: the learning process, elements of effective teaching, student evaluation and testing, course development, lesson planning, and classroom training techniques. According to one local FAA examiner, passing the 50 question fundamentals of instruction exam requires about an hour of study the night before the exam. In addition, the content is dated and does little to prepare a new instructor to be an effective teacher (M. Buckland, FAA examiner, personal communication, 2/28/06).

Flight instructor is not the first choice of aviation career among new commercial pilots. Aspiring pilots are aware that "since the advent of commercial aviation, instructors have become the least paid of all pilot positions" (Fratzke, 2004, p. 51). Instead, the position of flight instructor in a flight school pays the bills as the pilot waits to obtain the better paying and more desirable position of commercial pilot. On average, flight instructors working for a flight school receive $27/hour. The costs associated with offering instruction (a plane, insurance, tie-down fees, maintenance, etc.) further reduce the odds that pilots intentionally elect to become CFIs as their primary aviation career.

Quality of Instruction

The author of study recently completed training and earned her private pilot certificate. Due to the common turnover of CFIs (for better piloting jobs) at local flight schools, several CFIs provided the instruction. The quality of instruction ranged from outstanding to mediocre. Other individuals who had earned or attempted to earn their private pilot certificate shared similar stories with the researcher of uneven instructional quality for private pilot training. In several cases, it was the quality of instruction that led to a decision to drop out of private pilot training despite having made a significant investment of time and money toward the required hours.

Students are not alone in their concerns about the quality of instruction provided to student pilots seeking a private pilot certification. The check-ride concludes the entire instructional sequence. Recently, local FAA examiners who conduct the private pilot check-ride began meeting with CFIs to discuss concerns that private pilot students were not adequately prepared for the check-ride with the examiner (D. Lochner, FAA Examiner, personal communication, 11/23/05). The aim of these ongoing meetings is to develop strategies to improve instruction. The overall goal is to enhance pilot safety.

Purpose of the Study

The role of the flight instructor is critical to the preparation of future pilots at all levels. Although, flight instructors receive on-going instruction in aeronautics and aircraft maneuvers, they receive little initial information on effective techniques for instructing adult learners and no further continuing education in this area is required. This study is designed to uncover what CFIs know and believe about the teaching of adults. The research was guided by the following questions:

- How do CFIs conceptualize the teaching and learning processes?
- What experiences have shaped and informed the CFI's understandings of teaching adult learners?
- What do CFIs believe to be effective methods of instruction for adult learners?
- How do CFIs prepare for a typical instructional session?
- What assumptions do CFIs hold about how adult learners learn?
- Can CFIs articulate a teaching philosophy that guides their interactions with adult learners?

Study Participants

Twenty-two current CFIs were interviewed. At the time of the interviews, they ranged in age from 23 to 80 years. Seven of the CFIs were women; all others were men. They obtained their private pilot license between the ages of 16 and 47 years and their CFI rating between the ages of 18 and 50 years. At the time of the interviews, they had logged from 21 to 18,000 hours of instructional time and 294 to 28,000 hours of flight time. All teach at the private pilot level and provide flight instruction in two-passenger, single engine planes with dual controls (student and instructor have rudder, yoke and brake controls).

Method

A semi-structured, open-ended interview protocol was used. A common set of questions was asked, but the intent was to allow the experiences of the flight instructors to emerge. All interviews were taped and transcribed. Using Atlas TI software the interviews were coded and analyzed. Commonalities and patterns were sought in the responses to the questions, and from these emerging themes were identified. As the coding unfolded, the definitions and interpretations of the codes were further refined. A code dictionary was created. In the analysis patterns across the interviews according to gender and experience were sought. Initially, the data has been examined within the reflective practice framework of Schön (1987).

Findings

The cockpit of a single engine plane with dual controls is the classroom for the CFIs in this study. The student sits in the 'left seat', the spot typically designated for the pilot in command. Pilot in command is defined by the FAA as the person who has "has final authority and responsibility for the operation and safety of the flight" (FARAIM, 2006, p.6). The instructor sits in the 'right seat' providing guidance and feedback during dual instruction. In the cockpit, over the course of flight training, there is an evolution from pilot-in-command/instructor to passenger/instructor and a concurrent evolution of

student to pilot-in-command as the full control of the plane is gradually shifted from one to the other.

A number of study participants pointed out that aviation is one of the few professional fields where the least experienced professionals teach the next generation of professionals. However, as Steve notes, "I wanted to become a better pilot and when you teach someone something, you understand it 100-fold more . . . you will notice things you never imagined that you would notice and even in the more simpler tasks from taxiing or running the radios" (2006).

All participants reported on the dangers of teaching flying and many provided examples of recovering from stalls, spins, and near accidents during landings due to student errors made during dual instruction. As one CFI stated, "assume that all your students are trying to kill you" (Susan, 2006). Preparing their students to be safe pilots emerged as the dominant instructional goal of these CFIs.

The CFIs described a number of strategies they have developed or implemented to improve the effectiveness of their instruction to achieve that goal: pre-flight briefing, talking-it-through when introducing new maneuvers, sharing the controls, and post-flight debriefings. These strategies, frequently described as 'just common sense', developed from a process of "reflection on action" (Schön, 1983) to make meaning of their instructional practices and improve them and, thus, to improve student learning. Handing over the controls of the plane to the student and letting students make mistakes emerged as key instructional strategies especially when CFIs intentionally helped students reflect upon their mistakes. Instructors demonstrated reflection-in-action and reflection-on-action as they gained confidence in handing over the controls and letting students make mistakes. Several instructors described specific actions they took to help students reflect on mistakes or mishaps during flying and to anticipate and make corrections while in flight to prevent mishaps (stall, spin, unsafe landing, etc.). Although, nearly all instructors believed strongly that students needed to be allowed to make mistakes, not all instructors could articulate how they helped students learn from their mistakes.

Handing Over the Controls

Inexperienced CFIs, such as Susan (20 hours logged as a CFI) and Ann (185 hours logged as CFI) report an initial 'heavy handedness' on the controls and an awareness that they need to let go in order for their students to become pilot in command:

> *I had one student where I had taught him and I think I taught him well and it was actually him having to say to me, I can do this now and me having to let go a little bit . . . . I had to learn to do that . . . you shift from being on your guard or being – well, you shift from you being the pilot in command to them being the pilot in command and trusting that they're going to do what you've taught them to do. (Susan, 2006)*
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> *I'm a little bit still on the controls. At first I was a lot more on the controls like the first month. And coming down to land I was like, I won't do anything but my hands are right here. I keep my feet, especially when we get near the ground, I move my feet onto the rudder pedals and I keep my hand toward the steering column. But I've just been able to check things a little bit more when the landing looks like it's going to become something where we need to go around or that I'll have to take control like if they're in coming really fast. . . . At first - a bouncy landing isn't something bad - you can land it and bounce a little bit. And with the*

first students I was like, right away, that was unacceptable. I was like 'wow, this is a bouncy landing', but now I'll let them do that. (Ann, 2006)

Most of the CFIs reported a gradual easing up as they learned through experience the various indicators of student readiness (take directions from the tower, relaxed grips on the yoke, corrective actions to maintain level flight, etc.) to take over the controls. Marie (3,350 hours logged as CFI) describes the importance of not only letting students make mistakes, but letting students fly the plane when a mechanical failure occurs during flight especially when she considers it to be a good learning situation for the student:

I do know that I'm sure I did a lot more, not necessarily grabbing of the yoke but just touching it and helping correct or my feet on the rudders and over the years I've learned to be more relaxed and be able to sit back and be confident that they're going to be okay. And just sometimes if you know you can control it, you've got to let them get into a little bit of trouble and understand how they can get out of it because if you're always helping someone out of trouble, they'll never figure it out. . . . A student and I were doing a night flight and we went from Fairbanks to Nenana and the electrical went out on us on the way to Nenana . . . we had no flap operation and no radio or anything but we had our flashlight and we were all set and my student said, take it and I said no, I don't think so. I think you can do this but I'll hold the flashlight and at the time when you feel totally that you can't do it, just let me know and by me saying that, she kind of thought okay - okay and grimly determined and I held the flashlight and she did just fine. Had I been a new instructor I would have said yeah, maybe I should have taken the controls from her and then she would have never known if she could have done it or not. So over the years I've just - not that I'm totally laid back but I'm better able to relax and now my experience lets me know what's a good learning situation and what's not. (2006)

Student Mistakes

Both novice and experienced instructors frequently describe the importance of allowing students to learn from their mistakes during dual instruction. Experienced instructors report greater confidence than novice instructors in their ability to recover the plane from serious student errors indicating a greater ability to "reflect in action" (Schön, 1983):

That may be the toughest thing about being an airplane instructor: trusting your instincts and your reaction time to save a dangerous situation as opposed to recognizing this as a hard landing or a squirrelly landing but not an unsafe landing and letting them make mistakes. If I had to give you one statement of what makes this a challenge that is it. I think with my confidence and my experience, I think I can tell when something is not safe and then I react differently. I'm very quick on the controls if I think it's a dangerous situation. . . . But I think based on the student's experience and where we are in the training, I tend to let them make their own mistakes as much as I can. (John, 2006)

I think mostly it's that I know I can get us out of it and put the plane down or make a go around out it without hurting anything. I think that is the biggest thing for me because I am more confident in my experience. (Ed, 2006)

Flying requires development of technical expertise and consistent technique or what Schön (1987) refers to as 'knowing-in-action', but pilots need to develop the ability to reflect-in-action and reflect-on-action. Several CFIs described the actions they took to help students learn from their mistakes.

> *We talk immediately. In fact, I had one person who made a mistake, a fairly significant one and I made her pull off the runway and I said let's talk right now because I didn't want to wait until later in the day or after the lesson. So I try to be firm or stern without being mean or angry or upset and I always try to direct it back to safety. (John, 2006)*
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> *I think a bigger issue is to teach them to recognize stuff and to correct things because you learn right away that you're just going to make mistakes. You're always going to make mistakes and so instead of trying to teach someone to not make mistakes, it's more important to teach them to recognize and correct the mistakes. If you can teach them to analyze and think critically then they are going to get back safely or more likely. (Susan, 2006)*

The CFIs seem to have intuitively adopted a constructivist view of experiential learning, i.e., helping students to actively make sense of the experience and connecting it to prior learning (Fenwick, 2003) from the ground school.

Implications for Adult Education Practice

Although most adult educators practice in classrooms and educational spaces less confining than the cockpit of a single engine plane, the instructional strategies of handing over the controls so that students can truly learn to fly and the artistry of knowing how far to let a student go and be safe in making a mistake metaphorically resonate with our goals as adult educators for our students to assume control of their own learning, to learn the process of critical reflection, and to eventually fly solo.

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